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HAN, QI	

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2654	

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/464,076	CRUICKSHANK, BRIAN	
	Examiner	Art Unit	
	Qi Han	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Amendments

2. This communication is responsive to the applicant's amendment dated 03/21/2005. Applicant amended claims 21-23 and cancelled claim 24 (see pages 11-13).

Response to Arguments

3. Applicant's arguments filed 03/21/2005, with respect to claims 1-12 and 14-13, have been fully considered but they are not persuasive. In order to reflect the applicant's amendments, the claim rejection is modified, see below.

4. It is noted that the applicant cites several case laws regarding prima facie case of obviousness (page 15, last paragraph to page 16, paragraph 2), without specific argument regarding this issue, particularly for combination of prior art of Sharman and Hata. Thus, as a general response, applicant is directed to the related claim rejection.

5. In response to applicant's arguments against the references individually (regarding claims 1, 4-6 and 9-12, see amendment: page 16, last paragraph to page 18, last paragraph), one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It is noted that, as stated in the rejection, Sharman teaches looking up word in dictionary, removing possible prefix or suffix, concatenating diphone speech sample (small unit) together, and producing different output units (token, word, phoneme, syllable: suggest the capability of using larger pronunciation units); Hata teaches dictionary entries using sampled sounds associated with the corresponding word, particularly, teaches that whether to store words or phonemes (smaller unit) is a system design issue (motivation to use larger sample unit), therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Sharman and Hata to provide a stored speech sample in a word or other larger units (the removed prefix and/or suffix may be good candidate units, since they must associate some pronunciation unit for outputting, anyway). Further, the examiner disagrees with applicant's arguments that the third reference (a normal dictionary), showing prefix or suffix as the same entry as a word, is "simply irrelevant, and does not provide any motivation, suggestion..." It is noted that the most of dictionaries have prefix and suffix entries, just like a word entry, and the references (Sharman and Hata) both utilize TTS dictionary for looking up words, so that it is obvious to ordinary skill in the art to provide a TTS dictionary with prefix and/or suffix entries, as the same way as in a normal dictionary .

Regarding other independent and dependent claims (the amendment: pages 19-20), the response is based on the same reason described above, since they include the same or similar argued limitation.

As above reason, the applicant's arguments are not persuasive, and the rejection is sustained.

Claim Rejections - 35 USC § 103

6. Claims 1, 4-6, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman (US 5,774,854) in view of Hata et al. (US 5,878,393) hereinafter referenced as Hata and "new riverside university dictionary" hereinafter referenced as DIC.

Regarding **claim 1**, Sharman discloses a text to speech system, comprises:

"receiving a list of textual units, wherein said textual units in the list comprise words, prefixes and suffixes", (column 2, lines 1-2, 'a linguistic processor for generating a listing (list) of speech segments (textual units) ... from the input (received) text'; column 5, lines 18-27, 'removing (separate) **any possible prefix or suffix**, to see if the **word**, is related to one that is already in the dictionary');

"for each textual unit in the list, locating an associated speech sample in memory, said memory comprising vocabulary of words, prefixes and suffixes and a plurality of speech samples" (column 5, lines 'using a dictionary look-up (necessarily stored in memory)', 'breaking words down into syllables' and 'removing any possible prefix and suffix (also necessarily stored in a buffer or memory in order to produce output speech)'; column 6, lines 25-67, 'many samples (associated speech sample) of each diphone are collected', 'the relevant diphone are the retrieved (located) from the diphone library (necessarily stored in a memory) and concatenated together by the diphone concatenation unit 415 (PSOLA)'; Table 1 and column 7, lines 54-67, 'the output

buffer (memory) is used when a component produces **several output units** for each input unit that receives', including 'token', 'word', 'phoneme', 'syllable', see column 7, table 1); and "appending said associated speech sample to an output signal", (column 6, lines 25-67, 'concatenated together (appending) by the diphone (associated sample) concatenation unit 415 (PSOLA)', and 'produces the acoustic waveform (output signal)').

Even though, Sharman discloses using a dictionary look-up for words, break words down into syllables and removing possible prefix and suffix as stated above, Sharman does not expressly disclose "**each speech sample** corresponding to a one of said **words**, ... in said vocabulary". However, this feature is well known in the art as evidenced by Hata who discloses high quality concatenative reading system (title), and teaches "a dictionary of sampled sounds recorded and stored in advance", "the dictionary (including vocabulary) entries can be individual words", "the dictionary of samples may store more elemental speech components, such as individual phonemes" that means the system is capable of using larger units (such as word) or smaller units (such as phoneme) of speech sample, and that "whether to store entire words or individual phonemes is largely a system design issue" (column 3, lines 42-65). Hata also discloses data structure(s) including arrays, such as the dictionary, word list and phonologic feature table (see Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman for specifically providing a stored speech sample corresponding to a word or other unit, as taught by Hata, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Even though, Sharman in view of Hata discloses a stored speech sample corresponding to a word (or other unit) in a vocabulary (dictionary), as stated above, Sharman does not expressly disclose "each speech sample corresponding to a one of said ..., **prefixes and suffixes** in said vocabulary". However, the feature that a prefix or suffix being an entry treated as same way as a word in a dictionary is well known in the art as evidenced by DIC that teaches that prefixes and suffixes can be individually treated as entries, just like word entries in a dictionary (see DIC: entries "a-" and "-ability"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman in view of Hata for specifically providing a mechanism to treat a prefix or suffix as same way as a word in a dictionary, as taught by DIC, so that each stored speech sample can correspond to one of word, prefix and suffix, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Regarding **claim 4** (depending on claim 1), Sharman further discloses that processing input text at the substring level is based on a syllabified word (Sharman: column 5, line 31), so that combining the prior art features as applied above, the combined system satisfies all limitations as the claimed "for each textual unit in said consecutive plurality of said textual units, locating an associated speech sample in said memory; creating a speech unit by splicing together said plurality of associated speech samples; and appending said speech unit to said output signal."

Regarding **claim 5** (depending on claim 4), Sharman further discloses components of identifying diphones 410 (Fig. 4), diphone library 420 and diphone concatenation 415 for

overcoming audible discontinuities (column 6, lines 34-40), which corresponds to the claimed "after said splicing, processing said speech unit to remove discontinuities."

Regarding **claim 6**, Sharman discloses a text to speech system, by using a linguistic processor for various linguistic processes (Figs. 2-3), comprising:

"receiving a text file", (column 2, line 2-3, 'input text'; column 5, lines 1-2, 'obtain input from a source, such as … a stored file');

"parsing said text file into textual units, where each said parsed textual unit is one of a word, a prefix and a suffix", (column 5, lines 3-40, 'split input text into tokens (**words**)', implement special rules 'to map lexical items into canonical **word form**', 'using a dictionary look-up', 'remove any possible **prefix** or **suffix**'); and

"for each one of said parsed textual units, if said one of said parsed textual units corresponds to a stored textual unit in a vocabulary of textual units, and adding said stored textual unit to a list", (column 2, lines 1-2, 'generating **a listing** (list) of speech segments (equivalent textual units) … from the input text', herein the list is inherently stored in a buffer; column 5, lines 26-27 'to see if the word is related to one that is already in the dictionary'; column 6, lines 61-66 and column 7, Table 1, 'output unit represents the size of the **text unit** (including word, phoneme)' used for different process stages; column 7, lines 45-66, '**output buffer** is also used when a component produces several outputs units for each input unit that it receives', herein inherently including adding prefix and suffix to the buffer because without storing them in the buffer the system cannot output required speech).

Even though, Sharman discloses using a dictionary look-up for words, break words down into syllables and removing possible prefix and suffix as stated above, Sharman does not

expressly disclose "wherein said vocabulary of textural unit comprises **words** ... **each having a** pre-recorded speech sample associated therewith". However, this feature is well known in the art as evidenced by Hata who discloses high quality concatenative reading system (title), and teaches "a dictionary of sampled sounds (speech sample) recorded and stored in advance (pre-recorded)", "the dictionary (including vocabulary) entries can be individual words", "the dictionary of samples may store more elemental speech components, such as individual phonemes" that means the system is capable of using larger units (such as word) or smaller units (such as phoneme) of speech sample, and that "whether to store entire words or individual phonemes is largely a system design issue" (column 3, lines 42-65). Hata also discloses data structure(s) including arrays, such as the dictionary, word list and phonologic feature table (see Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman for specifically providing a stored speech sample corresponding to a word or other unit, as taught by Hata, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Even though, Sharman in view of Hata discloses a stored speech sample corresponding to a word (or other unit) in a vocabulary (dictionary), as stated above, Sharman does not expressly disclose "wherein said vocabulary of textural unit comprises ... **prefixes** and **suffixes** each having a pre-recorded speech sample associated therewith". However, the feature that a prefix or suffix being an entry treated as same way as a word in a dictionary is well known in the art as evidenced by DIC that teaches that prefixes and suffixes can be individually treated as entries, just like word entries in a dictionary (see DIC: entries "a-" and "-ability"). Therefore, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman in view of Hata for specifically providing a mechanism to treat a prefix or suffix as same way as a word in a dictionary, as taught by DIC, so that each stored speech sample can correspond to one of word, prefix and suffix, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67)Regarding **claim 9**, it recites an apparatus, which corresponds to the method of claim 1. The rejection is based on the same reason as described for claim 1, because claim 9 recites the same or similar limitation(s) as claim 1.

Regarding **claim 10**, it recites an apparatus having a processor (see preamble) that corresponding to the Sharman's disclosure 'the TTS system includes two microprocessors' (column 3, line 17). For rest of the limitations, the rejection is based on the same reason as described for claim 1, because claim 10 recites the same or similar limitation(s) as claim 1.

Regarding **claim 11**, it recites a computer readable medium for providing program control to a processor included in a text to speech converter (see preamble) that is read on the Sharman's disclosure that an arrangement is particularly suitable for a workstation (equivalent to computer) equipped with an adapter card with its own DSP (equivalent to processor) (column 3, line 21). For rest of the limitations, the rejection is based on the same reason as described for claim 1, because claim 9 recites the same or similar limitation(s) as claim 1.

Regarding **claim 12**, it recites an apparatus. The rejection is based on the same reason as described for claims 1 and 6, because claim 12 recites the same or similar limitation(s) as claims 1 and 6.

7. Claims 2-3 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata and DIC as applied to claims 1 and 12 above, and further in view of Oh (US 6,141,642).

Regarding **claim 2** (depending on claim 1), Sharman in view of Hata and DIC further discloses:

"when a one of said textual units in said list is indicated as not having an associated speech sample in memory", "passing said indicated textual unit", (column 5, lines 24-26, 'it is useful to include some back-up mechanism to be able to process (pass) words that are not in the dictionary'); and

"appending said converted speech sample to said output signal" (as applied in claim 6).

But, Sharman in view of Hata and DIC does not expressly discloses "passing said indicated textual unit to a **secondary text to speech engine**; receiving a speech sample converted from said indicated textual unit from said secondary text to speech engine". However, this feature is well known in the art as evidenced by Oh who discloses text-to-speech apparatus and method for processing multiple languages (title), comprising a plurality of test-to-speech engines for converting the sub-texts into audio wave data (speech sample)(column 1, line 65 to column 2, line 5), and illustrates a structure (Fig. 2) having two TTS engines, wherein when a character (text unit) of other language is detected the control is transferred to the other TTS engine (secondary TTS), including lexical analysis, parsing, converting the input (received) text (column 4, lines 23-53, and column 5, lines 1-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman in view of Hata and DIC by specifically providing a secondary TTS for further processing the unmatched text,

for the purpose of generating appropriated sound for a multiple language text (Oh: column 1, lines 57-58)

Regarding **claim 3** (depending on claim 2), Sharman in view of Hata, DIC and Oh discloses that said secondary text-to-speech engine comprises a phonetic text-to-speech engine based on a **voice talent**, (Hata: Fig. 1 and column 3, 42-45,' the reading system has a dictionary of sampled sounds 40'; column 3, line 26-31, 'the individual speech samples (equivalent to voice talent) each represent discrete units of speech, such as phonemes or words').

Regarding **claim 21**, it recites a method; the rejection is based on the same reason described for claims 1-2 and 6, because the claim recites the same or similar limitation(s) as combined claims 1-2 and 6.

Regarding **claim 22** (depending on claim 21), the rejection is based on the same reason as described for claim 6, because the claim recites the same or similar limitation(s) as claim 6.

Regarding **claim 23**, it recites an apparatus, which corresponds to a combination of method claims 1, 2 and 6; the rejection is based on the same reason as described for claims 1, 2 and 6, because the rejection for claims 1,2 and 6 covers the same or similar limitation(s) of claim 23.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata and DIC as applied to claim 6 above, and further in view of Microsoft Press ("Computer Dictionary", page 298) hereinafter referenced as R1.

Regarding **claim 7** (depending on claim 6), Sharman particularly discloses that apart from using a dictionary look-up, 'it is useful to include some back-up mechanism to be able to

process words that are not in the dictionary' (column 5, lines 24-26), which is corresponding to the claimed "if said one of said parsed textual units does not correspond to one of said stored textual units" and "as being out of vocabulary." Sharman further recites that 'the output unit represents the size of the text unit (e.g. word, sentence, phoneme); for many stages this is accompanied by additional information for that unit (e.g., duration, part of speech etc.)'(column 6, line 59 to column 7, line 2), which means that the text unit may be different in each of processing stages. But, Sharman in view of Hata and DIC does not expressly disclose to mark a text unit that does not match the one either in dictionary or by rule sets. However, this feature of marking a text unit data was well known in the art as evidenced by R1, which is a popular computer dictionary that gives common meaning and explanation of words or phrases in computer related arts. R1 further discloses that one of the common meanings of the word "mark" is "in applications and data storage, a symbol or other device used to distinguish one item from others like it" (page 298, entry "mark"), so that when using "mark" as a verb, it can be interpreted as an action to mark a symbol for certain data in a data storage, such as used for "text unit", for distinguishing the data from other data. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman by specifically marking a text unit of the processed data, as taught by R1, for the purpose of distinguishing the text unit that is not in the dictionary and preparing for further processing stages, such as processing in a back-up mechanism, generating phonemes, coping with prosodic information (Sharman, column 5, lines 25-26, column 5, lines 30-56 and column 5, lines 26). In addition, there must inherently exist some mechanism to distinguish a word that is not in the dictionary from other word that is in the dictionary in Sharman system, because Sharman suggest using a

dictionary lookup and some back-up mechanism for handling the two different situations (column 5, lines 23-25).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC and R1 as applied to claim 7 above, and further in view of O'Donnell ("programming for the world--a guide to internationalization", ISBN 0-13-722190-8).

Regarding **claim 8** (depending on claim 7), Sharman in view of Hata, DIC and R1 does not expressly disclose that "said marking comprises pre-pending a character to said textual unit." However, the further of marking a text unit by using a pre-pending character was well known, as taught by O'Donnell who writes a book of 'programming for the world', and discloses that appending a character symbol "$" to a digit string for distinguishing monetary amount from normal number (page 49, table 2.11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman and R1 by specifically marking a text unit of the processed data by adding a character, such as "$" or the like, in front of the text units, as taught by O'Donnell, for the purpose of easily distinguishing the text units and preparing for further processing.

10. Claims 14-15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC and Malsheen et al. (US 4,979,216) hereinafter referenced as Malsheen.

Regarding **claim 14**, Sharman discloses a text to speech system, comprising:

"a field for a textual unit", (column 7, lines 59-57 and Table 1, 'output buffer is also used when a component produces several output unit for each input unit that receives'; column 6, lines 59-67, 'the output unit represents the size of the text unit (e.g. word, phoneme)' in several different process stages; which necessary includes data structure and a field for handling the text unit),

"a field for speech sample associated with said textural unit", (Fig. 4 and column 6, lines 25-40, 'many samples (speech samples) of each phonemes are collected... for use in the diphone library', 'relevant diphones (associated with the text units) ...are concatenated together by diphone concatenation unit 415 (PSOLA)', which necessary includes data structure and a field for handling the synthesis speech),

"wherein said textual units is one of a word, prefix and suffix" (column 2, lines 1-2, 'a linguistic processor for generating a listing (list) of speech segments (textual units) ... from the input text'; column 5, lines 18-27, 'removing (separate) **any possible prefix or suffix** (treated as a textural unit) to see if the **word**, is related to one that is already in the dictionary'), and

"wherein a processor is capable of using the data structure to locate said associated speech sample associated with said textual unit from a memory comprising a vocabulary of words, prefixes and suffixes and a plurality of speech samples, and to use said associated speech sample to produce an output signal", (column 3, lines 17-18, the TTS system includes two microprocessors'; column 5, lines 'using a dictionary look-up (necessarily stored in memory)', 'breaking words down into syllables' and 'removing any possible prefix and suffix (also necessarily stored in a buffer or memory in order to produce output speech'; column 6, lines 25-67, 'many samples (associated speech sample) of each diphone are collected'; Table 1 and

column 7, lines 54-67, 'the output buffer (memory) is used when a component produces several output units for each input unit that receives', including 'token', 'word', 'phoneme', 'syllable'; column 6, lines 25-67, 'concatenated together (appending) by the diphone (associated sample) concatenation unit 415 (PSOLA)', and 'produces the acoustic waveform (output signal)').

Even though, Sharman discloses using a dictionary look-up for words, break words down into syllables and removing possible prefix and suffix as stated above, Sharman does not expressly disclose "**each speech sample** corresponding to a one of said **words**, ...in said vocabulary". However, this feature is well known in the art as evidenced by Hata who discloses high quality concatenative reading system (title), and teaches "a dictionary of sampled sounds recorded and stored in advance", "the dictionary (including vocabulary) entries can be individual words", "the dictionary of samples may store more elemental speech components, such as individual phonemes" that means the system capable of larger units (such as word) or smaller units (such as phoneme) of speech sample, "whether to store entire words or individual phonemes is largely a system design issue" (column 3, lines 42-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman for specifically providing a stored speech sample corresponding to a word or other unit, as taught by Hata, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Even though, Sharman in view of Hata discloses a stored speech sample corresponding to a word (or other unit) in a vocabulary (dictionary), as stated above, Sharman does not expressly disclose "each speech sample corresponding to a one of said ... , **prefixes and suffixes** in said vocabulary". However, the feature that a prefix or suffix being an entry treated as same way as a

word in a dictionary is well known in the art as evidenced by DIC that teaches that prefixes and suffixes can be individually treated as entries, just like word entries in a dictionary (see DIC: entries "a-" and "-ability"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman in view of Hata for specifically providing a mechanism to treat a prefix or suffix as same way as a word in a dictionary, as taught by DIC, so that each stored speech sample can correspond to one of word, prefix and suffix, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Further, Sharman in view of Hata and DIC does not expressly disclose the data structure having "a field for a frequency of a first portion of the speech sample that exceeds an amplitude threshold, and a field for a frequency of a last portion of the speech sample that exceeds an amplitude threshold," which can be broadly interpreted as a data structure feature having simple data fields for storing a frequency or duration related speech information, since this limitation does not specifically define any type of the data in the data structure design, non describe any relationship with other data fields or incorporation with other system elements. However, this feature is well known in the art as evidenced by Malsheen who discloses the data structures for storing a single phoneme enunciations (column 5, line 65 through column 6, line 26), and having multiple frequency and time (duration) fields (Table 1-4). As best understood in view of specification (page 9, paragraph 3 and page 10, paragraph 2), the field for a frequency of a first (or last) portion of the speech sample that exceeds an amplitude threshold can be interpreted as zero crossing data, which is inherently related to frequency or duration information about pitch that can be equivalently expressed in frequency, so that Malsheen disclosed data structure having

multiple frequency or time (duration) fields can be used for implementing the two claimed data fields. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sharman in view of Hata and DIC by specifically providing data structures having multiple fields for frequency or time (duration) information for processing and storing speech data, as taught by Malsheen, for the purpose of reducing cost (Malsheen: column 2, line 57).

In addition, in a broader view, a data structure is a template that data can be applied to. For computer and/or microprocessor based devices, data structure is an inherent nature for storing, accessing the required data through associated hardware and/or software functionalities. The claimed data structure includes two general fields for use without any specific data type (such as text, number, length) and any connection to other software and hardware, so that, in fact, any two data elements relating frequency or duration information can apply to the two fields of the template, thus Sharman, Hata, and Malsheen may, either individually or in combine, satisfy the limitation of these to fields.

Regarding **claim 15** (depending on claim 14), the claim only adds two more fields which is interpreted as the template with few more fields that any data can be applied to as stated above (claim 4, last paragraph), so that Sharman and Hata and Malsheen can, either individually or in combine, satisfy the claimed limitation(s). In addition, Sharman in view of Hata, DIC and Malsheen further discloses a phonological feature table (an array type of data structure) 52 (Hata: Fig. 3), comprising fields of phonemes that a word may begin and end with (Hata: column 5, lines 14-31, and column 7, lines 55-59), which further corresponds to the claimed "a field for a

phoneme that said textual unit starts with, and a field for a phoneme that the textual unit ends with."

Regarding **claims 19 and 20** (depending on claim 14), the rejection is based on same or similar reason described in claim 14, because these claims only add three more fields which is interpreted as the template with few more fields that any data can be applied to, therefore Sharman and Hata and Malsheen can, either individually or in combine, satisfy the claimed limitation(s).

11. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC and R1 as applied to claims 7 and 12 above, and further in view of Oh.

Regarding **claim 16** (depending on claim 7), the rejection is based on the same reason as described for claim 2, because the claim recites the same or similar limitation(s) as claim 2.

Regarding **claim 18** (depending on claim 12), which corresponds to a combination of claims 2 and 7; the rejection is based on the same reason as described for claims 2 and 7, because the claim recites the same or similar limitation(s) as claims 2 and 7.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC, R1 and O'Donnell as applied to claim 8 above, and further in view of Oh.

Regarding **claim 17** (depending on claim 8), the rejection is based on the same reason as described for claim 2, because the claim recites the same or similar limitation(s) as claim 2.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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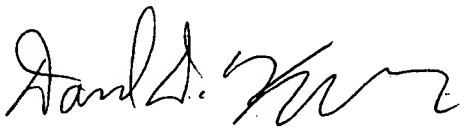
QH/qh
June 29, 2005



DAVID D. KNEPPER
PRIMARY EXAMINER